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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,464	10/22/2003	Nobuaki Kamiyama	9319G-000581	7325
27572	7590	08/16/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			LEBRON, JANNELLE M	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 08/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/691,464	<b>Applicant(s)</b> KAMIYAMA ET AL.	
	<b>Examiner</b> Jannelle M. Lebron	<b>Art Unit</b> 2861	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6,8-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-12 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 10 is objected to because of the following informalities:

“an another position” should be replaced with “another position” in line 6.

Appropriate correction is required.

2. Claim 15 is objected to because of the following informalities:

“onto a stage<sub>1</sub>” should be replaced with “onto a stage<sub>2</sub>” in line 2. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 and 9-12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takizawa et al. (US Patent 6,357,849).
5. Takizawa discloses a device manufacturing apparatus (20 in figure 14) comprising:

- Claim 1:

a discharge head (36 in figure 14) for discharging a droplet containing a functional material;

a stage (26 in figure 14) for supporting a substrate on which said droplet is discharged, and which is capable of moving relative to said discharge head (sub-scanning direction in figure 14);

a carrier (24 in figure 14) for carrying said substrate;

a detector (40 in figure 14) for detecting a discharge condition of said droplet which is discharged from a discharge nozzle formed in said discharge head;

a driving device (28 in figure 14) for moving said discharge head with respect to said detector (column 10, lines 54-59); and

a controller (54 in figure 16) for executing a detection operation by said detector during loading and unloading operations of said substrate (the paper is fed [loaded and unloaded] between printing swaths (col.7, lines 48-53) and the detection of malfunctioning nozzles takes place between said swaths (col.15, lines 18-38)), wherein

said detector and said stage are provided at different locations (as seen in figures 14 and 15; column 10, lines 66-67).

- Claim 2:

said detector comprising:

a light emitter (40a in figure 14) for emitting a detection light; and

a receiver (40b in figure 14) for receiving said detection light emitted from said light emitter (40a);

wherein said receiver (40b) determines whether said droplet is being discharged from said discharge nozzle , based on changes in the intensity of said detection light received by said receiver due to said liquid passing through the optical path of said detection light (column 13, lines 32-36).

- Claim 3:

wherein said controller performs calibration of said receiver at a predetermined timing (column 8, lines 3-8).

- Claim 4:

further comprising:

a recovery unit for performing a recovery operation of said discharge nozzle (column 9, lines 10-15).

- Claim 9:

wherein said device is at least one of; a liquid crystal element, an organic electroluminescent element, a plasma display element, an electron emission element, an optical element and a conductive film element (the device produced by Takizawa et al. is so-called "optical element").

6. Takizawa discloses a device manufacturing method comprising:

- Claim 10:

a step of discharging a droplet containing a functional material onto a substrate by means of a discharge nozzle (Abstract) in a discharge head (36 in figure 14; column 10, lines 51-53);

a carrying step of loading and unloading said substrate (column 10, lines 54-57);

a step of moving said discharge nozzle from a position at which said step of discharging said droplet is carried out, to another position at which an operation for detecting a discharge condition of said droplet which is discharged from said discharge nozzle is carried out, during said carrying step (from the "printing area" to the "adjustment area" in figure 15); and

a detection step of detecting said discharge condition during said carrying step (column 13, lines 25-36).

- Claim 11:

the steps of:

emitting detection light towards a receiver; and

determining whether said droplet is being discharged from said discharge nozzle, based on changes in the intensity of said detection light received by said receiver due to said droplet passing through the optical path of said detection light (col. 13, lines 25-36).

- Claim 12:

wherein calibration of the receiver is performed at a predetermined timing (column 8, lines 3-8).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Patent 6,357,849) in view of Bruch et al. (US Patent 6,814,422).

- Claim 5:

Takizawa et al. discloses the claimed limitations as set forth above except “wherein said controller performs said recovery operation corresponding to detection results of said detector, and reexecutes detection a predetermined number of times.”

Bruch et al. discloses a method of servicing a printhead, comprising a drop detection step and a nozzle recovery step controlled by a controller wherein the “step of performing automatic printhead intervention is initiated if, during a last fixed number of drop detections, the number of bad nozzles was greater than the threshold level. Preferably the fixed number of previous drop detections may be 8, 16, or 64 (column 15, lines 19-23).”

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a drop detector that reexecutes detection a predetermined number of times. One would have been motivated to modify Takizawa et al. to improve print quality as taught by Bruch et al.

- Claim 8:

Takizawa et al. discloses the claimed limitations as set forth above except “wherein said discharge head is two or more”. Takizawa et al. teaches a printhead (36 in figure 17) with a row of nozzles each different color (as seen in figure 17).

Bruch et al. discloses a carriage (40 in figure 2) positioned with the pens (50, 52, 54, 56 in figure 2) ready to be serviced by a replaceable printhead cleaner service station system (70 in figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a carriage positioned with two or more printheads. One would have been motivated to modify Takizawa et al. to make printhead replacement easier as taught by Bruch et al.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Patent 6,357,849) in view of Hah (US Patent 6,371,590).

Takizawa et al. discloses the claimed limitations as set forth above except "further comprising a display device for displaying detection results of said detector, and an error based on the detection results."

Hah teaches a display device that displays "an error message when at least one nozzle is malfunctioning, the quantity of malfunctioning nozzles in the printhead, the quantity of functioning nozzles in the printhead and which individual nozzles are malfunctioning, if any (column 5, lines 5-14)."

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a printing system with droplet detection means and a display device for displaying detection results. One would have been motivated to modify Takizawa in order to discover the presence of malfunctioning nozzles as taught by Hah.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Patent 6,357,849) in view of Cleary et al. (US 2002/0149660).

Takizawa et al discloses a method for manufacturing a device comprising:  
loading a substrate (paper P in fig.14) onto a stage (26 in fig. 14; in the sub-scanning direction as seen in fig.14);  
discharging droplets onto the substrate from a nozzle (Abstract) in a discharge head (36 in fig. 14; col.10, lines 51-53);  
unloading said substrate from the stage (as seen in fig.14); and  
during the loading or unloading of the substrate, testing the discharge head by passing droplets therefrom through a light beam (by light emitter 40a in figure 14; the paper is fed [loaded and unloaded] between printing swaths (col.7, lines 48-53) and the detection of malfunctioning nozzles takes place between said swaths (col.15, lines 18-38)).

Thus, Takizawa et al. teach all the claim limitations as set forth above except "treating the droplets to form a structure on the substrate".

Cleary et al. disclose "an apparatus for setting radiation curable ink deposited onto a substrate. The apparatus includes a series of ink jet printheads, which deposit ink onto the substrate, and a radiation source mounted laterally to the series of ink jet print heads (Abstract)." The substrate (32 in fig. 11) is fed through the printing system (in the direction of arrow A in fig. 11), receives ink from the printheads and is moved to the curing station (200 in fig.11; page4, paragraph 0045).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide means for treating the droplets after being deposited on the substrate to form a structure. One would have been motivated to modify Takizawa et al. in order to dry and cure the ink and obtain better print quality as taught by Cleary et al.

***Communication with the USPTO***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jannelle M. Lebron whose telephone number is (571) 272-2729. The examiner can normally be reached on Monday thru Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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